Handson Technology

User Guide

HT1209 Programmable Digital Thermostat

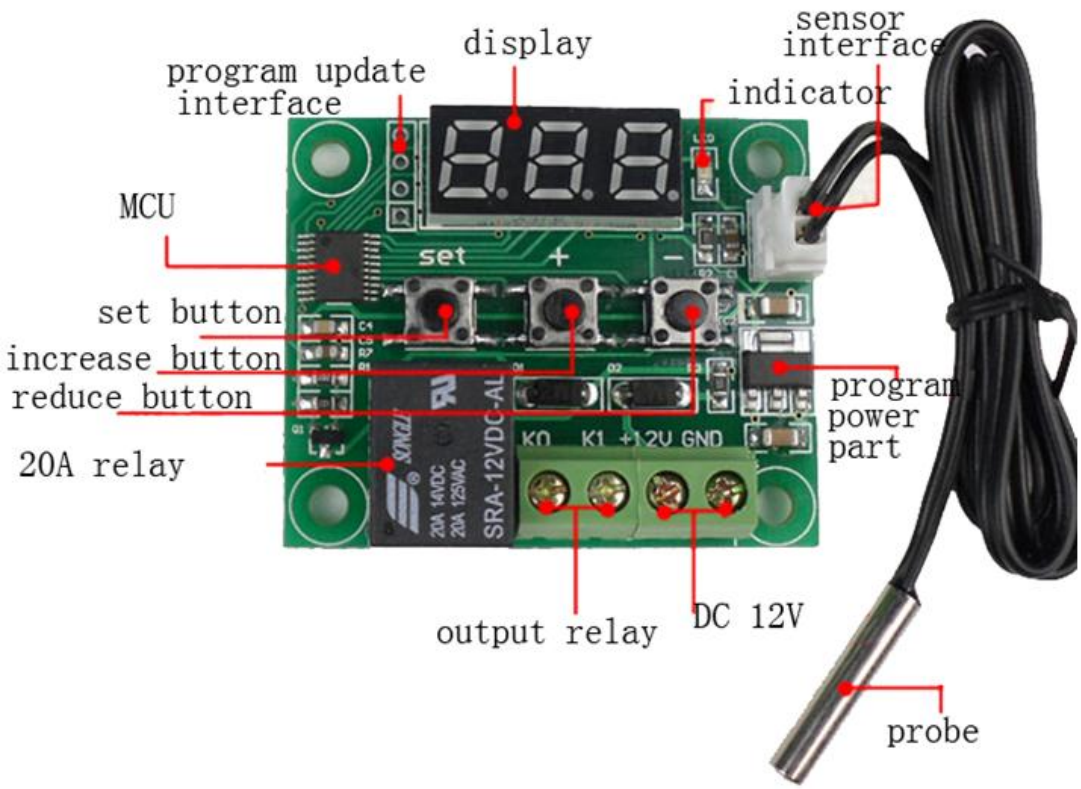
This HT1209 is a low cost yet highly functional thermostat controller. With this module you can intelligently control power to most types of electrical devices based on the temperature sensed by the included high accuracy NTC temperature sensor probe. 3 tactile switches allow for setting of various parameters including on & off trigger temperatures. The on board relay can switch up to a maximum of 240VAC at 5A or 14V DC at 10A. The actual temperature is displayed in degrees Centigrade with 3-digit 7-segment display. The relay On/Off state indicates by on board LED indicator.

SKU: SSR1029

Brief Data:

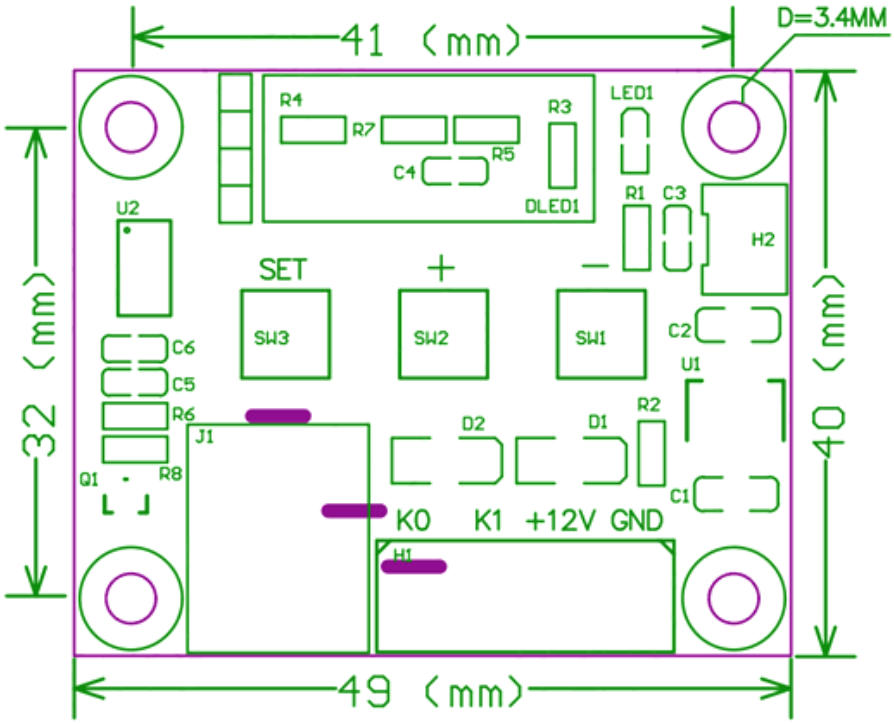
- Temperature range: -50℃ ~ 110℃.
- Dimensions: 48.5 x 40 x 14 mm.
- Temperature control mode: ON / OFF
- Resolution: When temperature is 0.1 (-9.9 ~ 99.9)
- Control accuracy: 0.1 ℃.
- Hysteresis accuracy: 0.1℃.
- Refresh rate: 0.5S.
- High temperature protection: 0 ~ 110℃
- Supply voltage: DC 12V.
- Standby current: ⩽ 35mA. Operating current ⩽ 65mA
- Relay Output power: 10A.
- Measurement input: NTC (10K 0.5%) 50cm Waterproof Sensor

Functional Diagram:

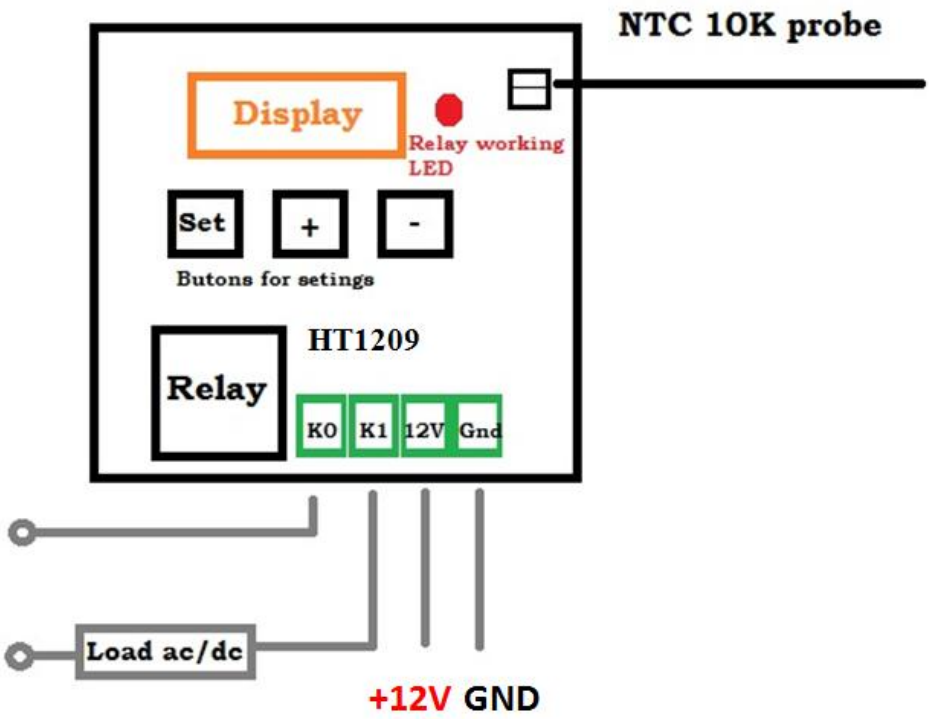


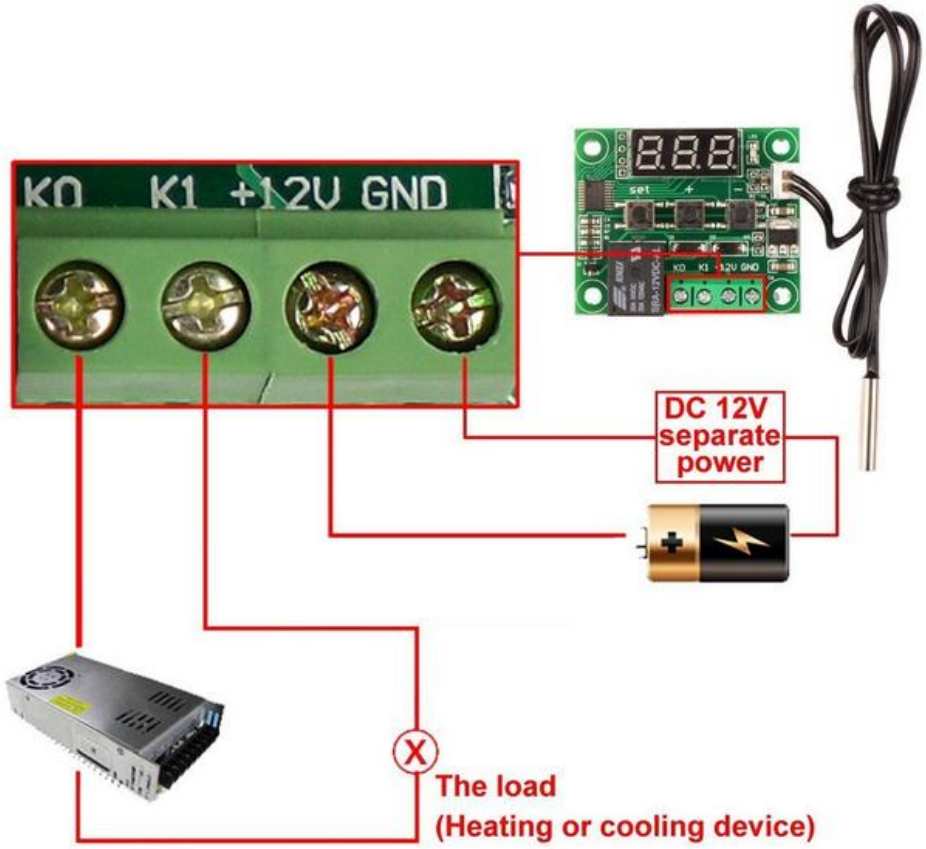
Mechanical Dimension:

Unit: mm



Application Block Diagram:





Operating Instructions:

Connect the power supply and after powered up, the actual measured temperature is displayed on the module. After pressing the "SET" button, press " + " or " - " to set the desired control temperature (long press " + " or " - " to fast increase or decrease). Press "SET" again to confirm the setting and return. The controller module with automatically monitor the temperature and performs the relay ON/OFF according to the temperature set. The thermostat output relay current is rated at 10A. This will satisfied variety of high-power loads requirement.

- LED indicator OFF: the relay is "OPEN". LED indicator ON: The relay is "CLOSED".
- 7-segmen display message:
  - "LL" indicates sensor open circuit.
  - "HH" indicates over-range, the relay will be disconnected.
  - "---" indicates high temperature alarm
- Long press the "SET" button to enter the main menu settings. Press " + " or " - " to switching between parameter setting P0-P6 (refer to "Parameter Setting" section for detail), then long press "SET" or 10 seconds without keystrokes to confirm the setting and return.

Parameter Setting:

To set any parameter first long press the 'SET' button for at least 5 seconds. The seven segments display should now display 'P0'. This represents parameter P0. Pressing the '+' or '-' buttons will cycle through the various parameters (P0 to P6). Pressing the 'SET' button while any of the parameters are displayed will allow you to change the value for that parameter using the '+' and '-' buttons (see below table). When finished setting a parameter press the set button to exit that option. If no buttons are pressed for approximately 5 seconds the thermostat will exit the parameter options and will return back to the default temperature display.

Code	Description	Range	Default Value
P0	Heating/Cooling	C/H	C
P1	hysteresis	0.1-15	2
P2	Upper Limit	110	110
P3	Lower Limit	-50	-50
P4	Correction	-7.0 ~ 7.0	0
P5	Delay Start Time	0-10 mins	0
P6	High Temperature Alarm	0-110	OFF

P0: Cooling or heating parameter:

The parameter P0 has two settings, C and H. When set to C (default) the relay will energized when the temperature is reached. Use this setting (C) if connecting to air-conditioning system. When set to H, the relay will de-energize when the temperature is reached, i.e. the heating element will cut off. Use this setting if controlling a heating device.

P1: Hysteresis parameter:

This set how much change in temperature must occur before the relay will change state. For example if set to the default 2°C and the trigger temperature has been set to 25°C, it will not de-energize until the temperature falls back below 23°C. Setting this hysteresis helps stop the thermostat from continually triggering when the temperature drifts around the trip temperature.

P2: Upper limit of the thermostat parameter:

This parameter limits the maximum trigger temperature that can be set. It can be used as a safety to stop an excessively high trigger temperature from accidentally being set by the user.

P3: Lower limit of the thermostat parameter:

This parameter limits the minimum trigger temperature that can be set. It can be used as a safety to stop an excessively low trigger temperature from accidentally being set by the user.

P4: Temperature offset compensation parameter:

Should you find there is a difference between the displayed temperature and the actual temperature (for instance if the temperature probe is on a long run of cable) you can make minor corrections to the temperature reading with this parameter.

P5: Trigger delay parameter:

This parameter allows for delaying switching of the relay when the trigger temperature has be reached. The parameter can be set in one minute increments up to a maximum of 10 minutes.

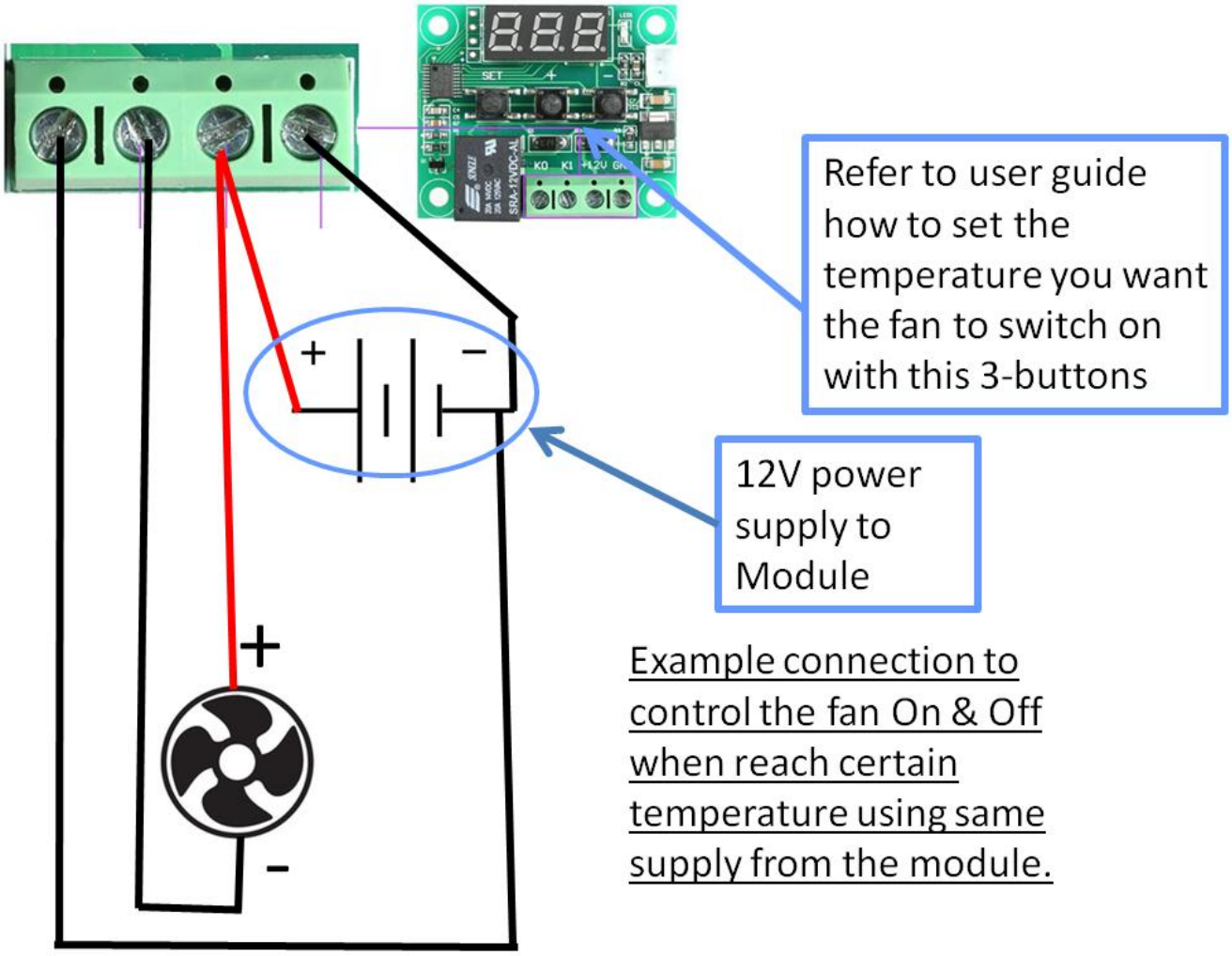
P6: High temperature alarm parameter:

Setting a value for this parameter will cause the relay to switch off when the temperature reaches this setting. The seven segment display will also show '---' to indicate an alarm condition. The relay will not re-energize until the temperature falls below this value. The default setting is OFF.

Application Examples:

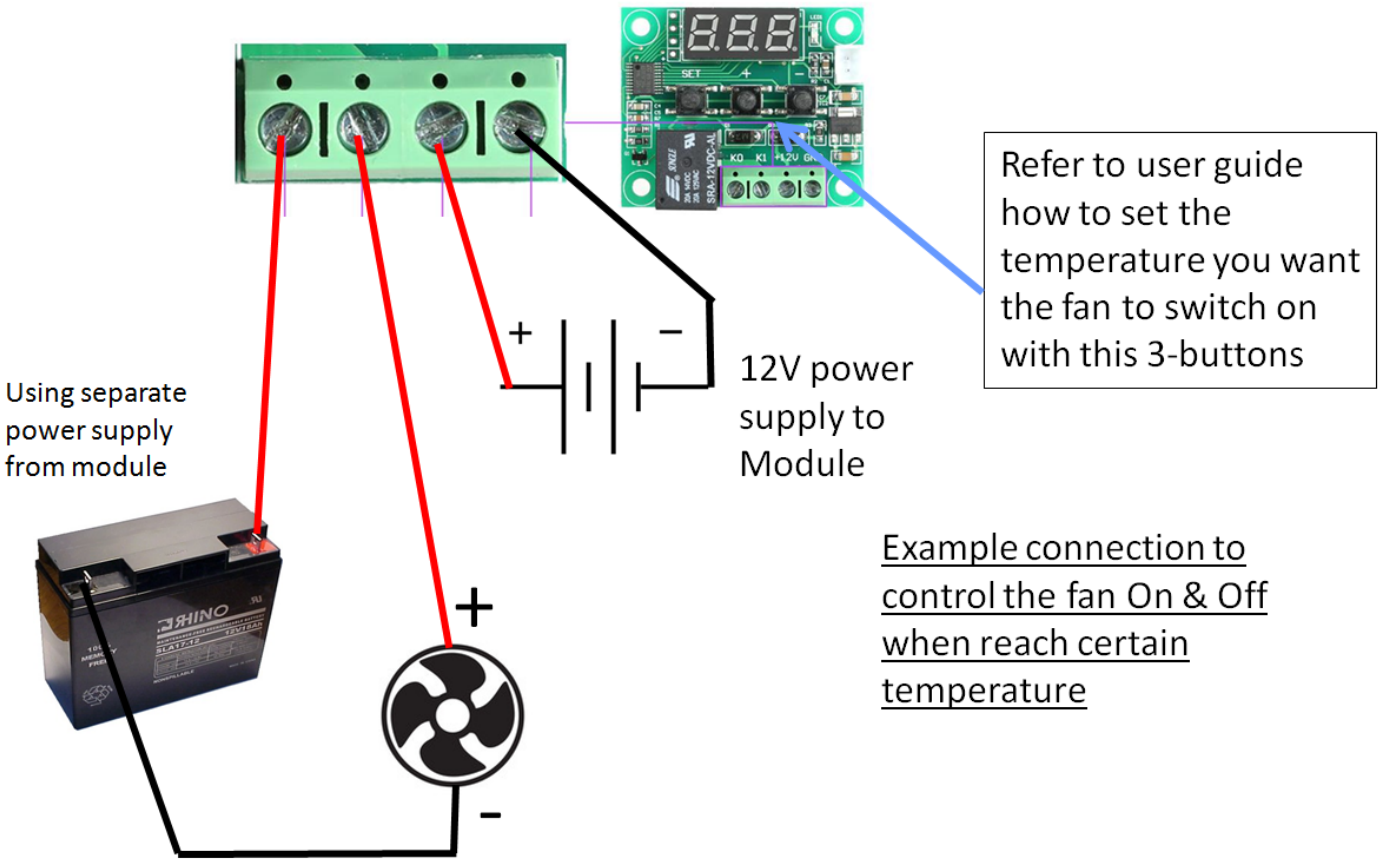
Connect the circuit as shown below:

In this application example, the fan will be switched 'On' when the temperature reached the limit set by the user. The fan will be switched 'Off' when the temperature cool down to the normal temperature. In this case, the fan is supply from same power supply as module, limited to maximum of 12V.



1. Press 'SET' button once to set the desired control temperature, i.e. 33°C.
2. Make sure the P0: Cooling or heating parameter is set to 'C' for cooling.
3. Try pressing the sensor for few second, the temperature will goes up. Once it reached 33°C, the fan will switch 'On'.
4. Release the hand from the sensor, the temperature will slowly goes down. Once it reached the temperature 2°C (hysteresis default setting) below the set temperature, i.e. 33-2= 31°C, the fan will switch 'Off".
5. You can change the 2°C Hysteresis setting to other value. Refer to "Parameter Setting" on how to change this setting on P1: Hysteresis parameter.

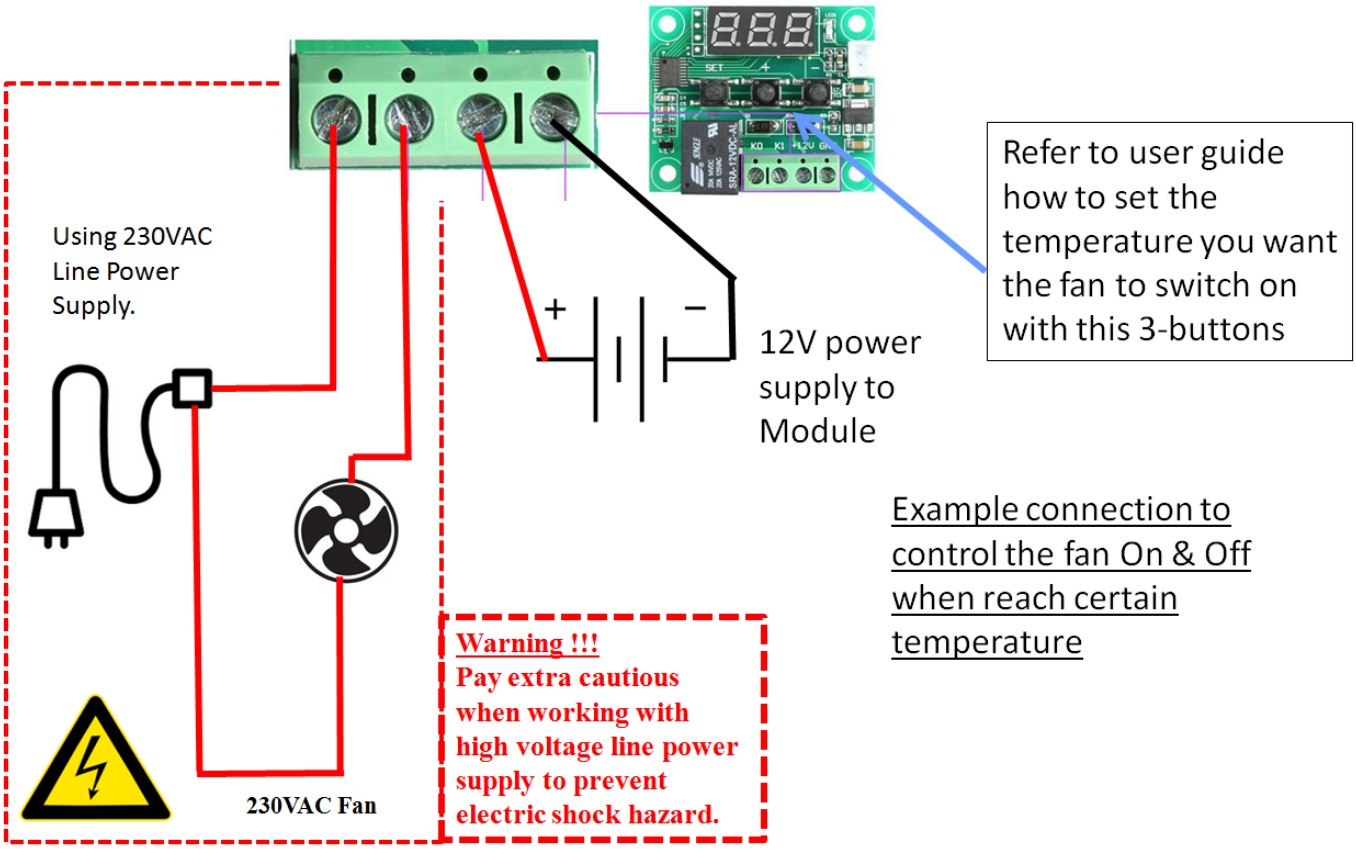
Using Separate Power Supply than Module:



Example connection to control the fan On & Off when reach certain temperature

Connecting Load to High Voltage 230VAC Power Supply:

Warning: This connection only for experience profession electrician to prevent electric shock hazard !!!



Web Resources:

- http://handsontec.com/index.php/product/ht1209-programmable-digital-thermostat/
- http://handsontec.com/index.php/product/tec1-12706-peltier-thermoelectric-cooler/

HandsOn Technology provides a multimedia and interactive platform for everyone interested in electronics. From beginner to diehard, from student to lecturer. Information, education, inspiration and entertainment. Analog and digital, practical and theoretical; software and hardware.

open source hardware

HandsOn Technology support Open Source Hardware (OSHW) Development Platform.

Learn : Design : Share

handsontec.com

The Face behind our product quality…

In a world of constant change and continuous technological development, a new or replacement product is never far away – and they all need to be tested.
Many vendors simply import and sell wihtout checks and this cannot be the ultimate interests of anyone, particularly the customer. Every part sell on Handsotec is fully tested. So when buying from Handsontec products range, you can be confident you're getting outstanding quality and value.

We keep adding the new parts so that you can get rolling on your next project.

Breakout Boards & Modules

Connectors

Electro-Mechanical Parts

Engineering Material

Mechanical Hardware

Electronics Components

Power Supply

Arduino Board & Shield

Tools & Accessory